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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/590,037	08/18/2006	Anja Gerhard	14113-00043-US	5568

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EXAMINER
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WILSON, MICHAEL H

ART UNIT	PAPER NUMBER
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1794

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/590,037	<b>Applicant(s)</b> GERHARD ET AL.	
	<b>Examiner</b> MICHAEL WILSON	<b>Art Unit</b> 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,4,7-13 and 15-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4,7-13 and 15-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

1. This Office action is in response to Applicant's amendment filed 9 February, 2009, which cancels claims 2, 3, 5, and 6 and amends claims 1, 4, 7, 11, 12, 17, 18, 22, 23, 25, and 26.

Claims 1, 4, 7-13, and 15-28 are pending.

2. The rejection of under 35 U.S.C. 112, first paragraph of claims 1-13 and 15-27, is withdrawn due to applicant's amending of the claims of the claims in the reply filed 9 February, 2009.

3. The rejection of under 35 U.S.C. 112, second paragraph of claims 5, 11, 12, 17, 18, 23, 25, and 26, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention is withdrawn due to applicant's amending of the claims in the reply filed 9 February, 2009.

4. The terminal disclaimer filed on 9 February, 2009 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of any patent granted on Application Number 10/563,716 has been reviewed and is accepted. The terminal disclaimer has been recorded.

### ***Claim Objections***

5. Claim 1 is objected to because of the following informalities:

Regarding claim 1, in line 24, "substituted b one" should read --substituted by one--. In line 34, --in-- should be added between "heteroaromatic system" and "formula (2)".

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 28 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 28, examples 1 to 52 include compounds which are not within the scope of independent formulae (2) to (4) in claim 1, rendering the claim indefinite. Example compounds 1-12, 14-40, 43, and 50-52 are not within the scope of claim 1.

### ***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1, 4, 7-10, 13, 17-21, 23, and 25-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Onikubo et al. (US 6,280,859 B1).

Regarding claims 1, 4, and 19, Onikubo et al. disclose an electronic device which is an organic electroluminescent device, comprising a cathode, an anode and at least one organic layer which does not contain a phosphorescent emitter (column 1, lines 65 and 66; column 183, lines 18-30). The reference teaches the organic layer to comprise a compound of formula (1) meeting instant formula (4) wherein Y is sulfur and X is oxygen (column 2, line 15, "A" groups A-62, A-84, and A-114 table (1), "X" groups B-2, table (2)).

Regarding claim 7, Onikubo et al. discloses all the claim limitations as set forth above. Additionally compounds of formula (1) are inherently not planar, the nitrogen atoms (either side of group A) possess an electron lone pair which gives the orientation around the nitrogen a pyramidal structure.

Regarding claims 8-10, Onikubo et al. discloses all the claim limitations as set forth above. Additionally the reference discloses compounds of formula (1) containing a  $sp^3$  hybridized tertiary carbon (compound 26, table 3, column 87).

Regarding claim 13, Onikubo et al. discloses all the claim limitations as set forth above. Additionally the reference discloses wherein instant R1 and R2 are biaryl groups, the phenyl groups linked by an oxygen.

Regarding claims 17, 18, 20, and 21, Onikubo et al. discloses all the claim limitations as set forth above. Additionally the reference discloses wherein the compound comprises more than 50% of the layer (column 193, lines 62-67) or is a pure layer (column 183, lines 34-39), and wherein further layers, including a hole injection layer, are present (column 184, lines 35-38).

Regarding claim 23, Onikubo et al. discloses all the claim limitations as set forth above. Additionally the reference discloses wherein the emission layer comprises a fluorescent emitter and a compound for formula (1) (column 194, lines 56-64). The reference also discloses that the compounds are electron transporting (column 179, lines 7-10) therefore the compound of formula (1) in the emitting layer can also be considered an electron transport material, meeting the present claim.

Regarding claim 25-27, Onikubo et al. discloses all the claim limitations as set forth above. Additionally the reference discloses wherein a hole injection layer and electron injection layer are adjacent to the light emitting layer containing a compound of formula (1) (column 184, lines 35-44). While the reference does not explicitly state the wavelength of the light emission, the reference discloses devices comprising compounds of formula (1) as light emitting with high brightness (column 184, lines 48-51). Light visible to the human eye is roughly between 380 and 750 nm (exact endpoints vary); light outside this wavelength range is not visible to the eye. Given that it is the object of organic electroluminescent devices to produce light which is visible to the human eye the claim limitation is considered to be met, and the compounds would be expected inherently to produce light between 380 and 750 nm.

### ***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

12. Claims 11, 12, 15, 16, 22, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onikubo et al. (US 6,280,859 B1) as applied to claims 1 above.

Regarding claim 11, Onikubo et al. discloses all the claim limitations as set forth above. Additionally the reference discloses wherein A is a 9,9'-disubstituted fluorene (A-73, table 1, column 21) or a dihydrophenanthrene derivative (A-10 and A-11, table 1, column 7) and X is a compound of with the structural unit Y=X of instant formula (4) (B-2, table 2, column 42). While the reference does not exemplify a compound with these groups used together, this does not negate a finding of obviousness under 35 USC 103 since a preferred embodiment such as an example is not controlling. Rather, all disclosures "including unpreferred embodiments" must be considered. *In re Lamberti* 192 USPQ 278, 280 (CCPA 1976) citing *In re Mills* 176 USPQ 196 (CCPA 1972). Therefore, it would have been obvious to one of ordinary skill in the art to utilize a 9,9'-disubstituted fluorene (A-73, table 1, column 21) or a dihydrophenanthrene derivative

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(A-10 and A-11, table 1, column 7) as group A with an X with the structural unit Y=X of instant formula (4) (B-2, table 2, column 42) given that Onikudo et al. teaches each as suitable.

Regarding claim 12, Onikubo et al. discloses all the claim limitations as set forth above. The reference does not explicitly disclose a spirobifluorene for group A of formula (1).

However it would be obvious to one of ordinary skill in the art at the time of the invention that a spirobifluorene group would be suitable given that the reference teaches aryl groups as suitable (column 4, lines 50-52) and discloses a wide variety of aryl groups (A-1, A-6, A-7, A-8 to A-18, A-64 to A-68, A-73, A-76, A-77, table 1, columns 7-23) including 9,9'-disubstituted fluorene (A-73, table 1, column 21), a group which only differs from a spirobifluorene by a single bond which links the two phenyl substituents. One of ordinary skill in the art given this teaching would reasonably expect spirobifluorene to produce a compound with similar properties and suitable for the same purpose. One of ordinary skill would be motivated by a desire to produce a new compound for the purposes of the prior art, within the guidelines of the prior art.

Regarding claim 15, Onikubo et al. discloses all the claim limitations as set forth above. Additionally the reference discloses that the glass transition temperature and melting point of the compounds is high due to the steric bulk and molecular weight of the compounds (column 46, lines 16-18). However the reference does not disclose specific values for the glass transition temperature ( $T_g$ ). Given that the reference teaches layers for light-emitting devices the "high"  $T_g$  of the compounds clearly be



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higher than 100°C. Evidence to support this position is that the compounds are within the formula claimed by applicant and taught to have glass transition temperatures higher than 100°C. Therefore since the compounds disclosed by Onikubo et al. being within the formula claimed by applicant, the glass transition temperature of the compounds would be expected inherently to have the same properties as disclosed by applicant. Recitation of a newly disclosed property does not distinguish over a reference disclosure of the article or composition claims. *General Electric v. Jewe Incandescent Lamp Co.*, 67 USPQ 155. *Titanium Metal Corp. v. Banner*, 227 USPQ 773. Applicant bears responsibility for proving that reference composition does not possess the characteristics recited in the claims. In *re Fitzgerald*, 205 USPQ 597, In *re Best*, 195 USPQ 430.

Regarding claim 16, 22, and 24, Onikubo et al. discloses all the claim limitations as set forth above. Additionally the reference discloses the compounds of formula (1) comprising a fluorescent emission layer (column 184, lines 35-50). The reference also discloses the compounds of formula (1) are “excellent in the character of injection of electrons from a metal cathode and the property of transportation of electron” (column 179, lines 7-10). The reference also discloses a layer of material between the light-emitting layer and the cathode which “is a material which is capable of transporting electrons, receiving electrons from a cathode, injecting electrons into a light-emitting layer” (column 180, lines 65-67). The reference does not explicitly disclose a compound of formula (1) forming an electron transport layer.

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However it would be obvious to one of ordinary skill in the art at the time of the invention to use a compound of formula (1) as the electron transport (injection) layer in the device of Onikubo et al. One of ordinary skill would reasonably expect using a compound of formula (1) in the electron injection layer, which is also inherently an electron transporting layer, would be suitable given that the reference teaches the compounds are “excellent” in electron injection and transport, which is the requirement for the material of the electron injection/transport layer. While the reference does not exemplify compounds of formula (1) used as electron injection/transport materials, this does not negate a finding of obviousness under 35 USC 103 since a preferred embodiment such as an example is not controlling. Rather, all disclosures “including unpreferred embodiments” must be considered. *In re Lamberti* 192 USPQ 278, 280 (CCPA 1976) citing *In re Mills* 176 USPQ 196 (CCPA 1972). Therefore, it would have been obvious to one of ordinary skill in the art to utilize a compound of formula (1) in the electron injection/transport layer given that the reference teaches one.

### ***Response to Arguments***

13. Applicant's arguments with respect to claims 1, 4, 7-13, and 15-27 have been considered but are moot in view of the new ground(s) of rejection, which were necessitated by amendment.

***Conclusion***

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL WILSON whose telephone number is (571) 270-3882. The examiner can normally be reached on Monday-Thursday, 7:30-5:00PM EST, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on (571) 272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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16. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. Lawrence Tarazano/  
Supervisory Patent Examiner, Art Unit 1794

MHW